

*U. S. Department of Energy at Grand Junction, Colorado*  
**Environmental Sciences Laboratory**

Selected Publications

Morrison, S. and Mushovic, P., 2005. "Permeable reactive barriers: precipitation of corrosion products is causing significant hydraulic changes". *Waste Management Conference*, February 2005, Tucson, Arizona.

Waugh, W. J., G. M. Smith, and A. W. Kleinrath, 2004. "Design and stewardship of engineered covers: a legacy management paradigm", *American Nuclear Society Winter Meeting*, November 18, 2004, Washington DC.

Peterson, D., T. Bartlett, S. Morrison, A. Lasse, and A. Kleinrath, 2004. "Performance evaluation for a U.S. Department of Energy legacy management ground water remediation system", *American Nuclear Society Winter Meeting*, November 18, 2004, Washington DC.

Peterson, D. and Morrison, S., (2005 accepted). "Performance assessment at legacy management sites affected by variable chemical transport conditions", *American Nuclear Society Conference*, August 2005, Denver, Colorado.

McKeon, C., E. P. Glenn, F. Jordan, W. J. Waugh, and S. G. Nelson, 2005. "Rapid nitrate and ammonium loss from a contaminated desert soil." *Journal of Arid Environments* 61:119-136.

Gilmore, T., B. Looney, B. Riha, J. Waugh, and C. Sink, 2004. *Characterization and Monitoring for MNA and Enhanced Attenuation*. Proceedings of The Fourth International Conference on Remediation of Chlorinated and Recalcitrant Compounds, May 24-27, 2004, Monterey, California.

Clarke, J.H., M.M. MacDonell, E.D. Smith, R.J Dunn, W.J. Waugh, 2004. Engineered containment and control systems: Nurturing nature. *Journal of Risk Analysis* 24:771-779.

Smith, G. M., and Waugh, W. J., 2004. "Influences of construction subtleties on the hydraulic performance of water-balance covers," in: *Tailings and Mine Waste '04*, A. A. Balkema, London, pp. 143- 149.

Waugh, W.J., 2004. *Designing Sustainable Covers for Uranium Mill Tailings*. Proceedings - 16<sup>th</sup> High Altitude Revegetation Workshop. Soil and Crop Sciences Dept., Colorado State University, Fort Collins, CO.

Waugh, W.J., G.M. Smith, and P. Mushovic, 2004. [\*Monitoring the Performance of an Alternative Cover Using Caisson Lysimeters\*](#). Proceedings of the Waste Management 2004 Symposium, University of Arizona, Tucson, Arizona.

Gerhart, V.J, W.J. Waugh, E.P. Glenn, and I.L. Pepper, 2004. *Chapter 19: Ecosystem Restoration*. In: J.F. Artiola, I.L. Pepper, and M.L. Brusseau (eds.). *Environmental Monitoring*. Academic Press, San Diego, CA.

Waugh, W.J., 2004. [\*Design, Performance, and Sustainability of Engineered Covers for Uranium Mill Tailings\*](#). Proceedings of Long-term Performance Monitoring of Metals and Radionuclides in the Subsurface: Strategies, Tools, and Case Studies. U.S. Environmental Protection Agency, U.S. Department of Energy, U.S. Geological Survey, Nuclear Regulatory Commission, April 21-22, 2004, Reston, VA.

Waugh, W.J., 2004. *Sustainability of Conventional and Alternative Landfill Covers*. Designing, Building, and Regulating ET Landfill Covers, U.S. Environmental Protection Agency, March 9-10, 2004, Denver, CO.

McKeon, C., E. P. Glenn, W. J. Waugh, and S. G. Nelson (accepted), "Water and nitrate uptake patterns of grazed and ungrazed desert shrubs growing over a nitrate contamination plume" in *Journal of Arid Environments*.

Jordan, F. L., C. A. McKeon, W. J. Waugh, T. T. Thompson, A. D. Mathias, and E. P. Glenn, (submitted). "Irrigation-induced rapid denitrification and nitrous oxide production at a nitrate contaminated former uranium milling site, Submitted to *Environmental Science & Technology*.

Morrison, S. J., Mushovic, P. and Niesen, P. (in preparation). "Molybdenum uptake in a permeable reactive barrier: causes of early breakthrough", anticipated draft by August 2005 to be submitted to *Environmental Science & Technology*.

Waugh, W.J., P. Mushovic, and A. Kleinrath, 2003. *Design and Monitoring of an Evapotranspiration Cover at the Monticello, Utah, Superfund Site*. Fifth Environmental Technology Symposium and Workshop, Interstate Technology Regulatory Council, March 24-28, 2003, Charlotte, NC.

Morrison, S. J., 2003. "Performance Evaluation of a permeable reactive barrier using reaction products as tracers," *Environ. Sci. Technol.*, v. 37, p. 2302-2309.

Morrison, S. J., Carpenter, C. E., Metzler, D. R., Bartlett, T. R., and Morris, S. A., 2002. "Design and Performance of a Permeable Reactive Barrier for Containment of Uranium, Arsenic, Selenium, Vanadium, Molybdenum, and Nitrate at Monticello, Utah," *in* Naftz, D. L., Morrison, S. J., Fuller, C. C., and Davis, J. A. (eds.) *Groundwater Remediation Using Permeable Reactive Barriers, Applications to Radionuclides, Trace Metals, and Nutrients*, Academic Press, Amsterdam, p. 371 –399.

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Carpenter, C. E. and Morrison, S. J., 2001. *In-Situ Method to Remove Iron and Other Metals From Solution in Groundwater Down Gradient From Permeable Reactive Barriers*, U.S. Patent 6,254,786.

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Bergmann-Tabbert, D., J. Waugh, and G. Smith, 2000. *Concepts for and Experience Gained From Tailings Capping Systems in the Uranium Mill Tailings Remedial Action Project, USA*. Proceedings of the Wismut Conference on Mine Rehabilitation, July 11-14, 2000, Schlema, Germany.

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